



# An Energy Efficiency Workshop & Exposition

Kansas City, Missouri

## *Alternative Financing*

Presented by:  
Vince Heuser

Vice President System Operations

Nolin Rural Electric Cooperative

Elizabethtown, Kentucky

June 6, 2001

- 26,000 meters
- 2500 miles of line
- 14 miles from Ft Knox
- Provides electric service to tank firing ranges



## ***Rural Electric Cooperatives***

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- Over 1000 RECs in 48 states
- Suppliers in 80% of US counties
- Serve over 34 million consumers and 1 million businesses



## ***Rural Electric Cooperatives***

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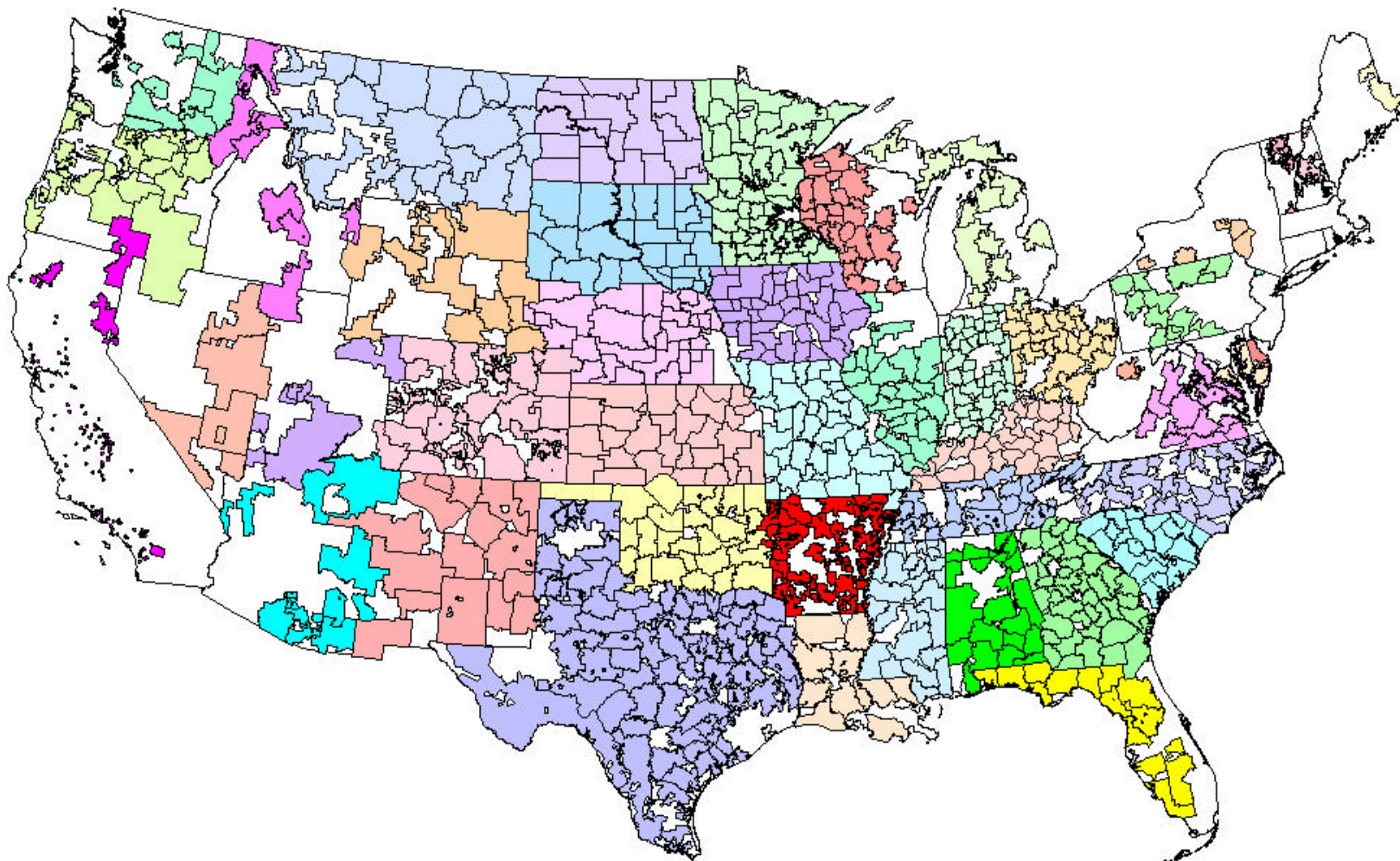
- o Collectively represent the country's fastest growing utility
- o Own and operate half the nations power lines
- o Have invested \$70 billion





## *America's Electric Cooperative Network*

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June 3-6, 2001

[www.energy2001.ee.doe.gov](http://www.energy2001.ee.doe.gov)



## ***Ft. Knox***

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- 5 Substations
- 40 MW Peak Load
- On post population: 24,000
- 109,000 Acres
- Gold Vault
- Hospital
- 3000 Buildings
- School system with 3100 Students



## ***Contract:***

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- DSM Contract between Nolin RECC and Fort Knox, January 22, 1996
- Nolin selected after Investor owned utility was unable to negotiate contract
- ESPC Contract was too costly



## *Why DSM?*

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- o Simple Contract
- o Local Contacts
- o Payments made through utility bill
- o Less expensive than ESPC
- o Less red tape than ESPC



## ***Purpose:***

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- To directly or indirectly reduce the peak demand and total consumption:
  - Electric Power
  - Natural Gas
  - Water
  - Waste Water



## *Type of work performed*

- Interior and exterior lighting replacement
- Lighting control improvements
- Motor replacement with high efficient motors
- Boiler control improvements
- Packaged air conditioning unit in replacement
- Cooling tower retrofit
- Economizer installation
- Energy management control system installation, replacement or alteration
- Occupancy sensor and LED exit sign installation
- Infrared heating for work zones within large open bays or warehouses
- Fans and pump replacement or impeller trimming
- Chiller retrofit
- Upgrade of natural gas-fired boilers with new controls



## ***Type of work performed cont.***

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- Steam trap maintenance and replacement
- Steam system leak identification and repair
- Insulation and daylighting control installation
- Programmable thermostat installation
- Variable speed drive utilization
- Reflective solar window treatment
- Replacement of air conditioning and heating units with heat pumps
- Addition of liquid refrigerant pumps to reciprocate air conditioning units
- Window air conditioning replacement with high efficiency units
- Installation of energy-efficient appliances
- Power factor correction
- Individual meter and automatic meter reading system installation



## ***Education Building ECO #40***

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- o Geothermal \$450,000
- o Window Replacement \$108,000



# *Education Building*

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June 3-6, 2001

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# *Education Building*

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# ***Energy Conservation Order***

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## o ECO

- Description of work
- Estimated peak period and annual energy reduction
- Estimated installation cost
- Projected yearly purchased Utility and/or fuel cost savings
- Contract rate of interest
- Simple payback period



# ECO Activity Proposal

<b>NOLIN RURAL ELECTRIC COOPERATIVE CORPORATION</b> <b>ECO ACTIVITY PROPOSAL</b> <b>September 22, 2000</b>			
PROJECT NAME:	1174 Windows & GCHP HVAC; Spray foam insulate 6 Bldgs to incl Potts Park bldgs 6142,3,4,5,6,6147,#86, #		
	Install water heater in bldg 6581		
	(ECO 40)		
LOCATION:	Fort Knox, KY		
DOCUMENT NUMBER:	LG00670-OJ; LG00674-OJ; LG00684-OJ		
CONTRACTOR SUBMITTING PROPOSAL:	Nolin Rural Electric Coop. Corp.		
	Elizabethtown, KY		
	Window Company		
	Spray-Tec, Inc. Shelbyville, KY		
	McMillen Mechanical		
	Lusk Mechanical		
PROJECT COST (INCLUDING INTEREST):	Audit 0040		<b>\$0.00</b>
	Study 0040		<b>\$0.00</b>
	ECO 0040		<b>\$647,784.00</b>
	Nolin RECC Mgt & Fee	.07	<b>\$45,344.88</b>
	Total ECO Activity Cost		<b>\$693,128.88</b>
METHOD OF PAYMENT:	Payment shall be made according to Section 3.1 Energy Conservation Surcharge, Contract # DABT 23-84C0089		
INITIAL PAYMENT PER MONTH:			<b>\$9,566.62</b>
MONTHLY ENERGY SAVINGS PER MONTH OVER TERM OF LOAN:			<b>\$4,189.65</b>
ANNUAL OPERATING COST SAVINGS:			<b>\$50,275.80</b>
DATE:			
SIGNATURE:			
	Operations & Engineering Manager		

## ***Eglin Air Force Base, FL***

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- Remote “Site C-6” is home the world’s largest phased-array radar station – 24 hour space surveillance satellite tracking
- Four buildings totaling over 200,000 gsf
- Uses enough power to run a town of 8,000 residents





## ***Eglin AFB & Choctawhatchee Electric Cooperative (CHELCO)***

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- In 1999, CHELCO entered into Energy Services Agreement with Eglin to accomplish ECM's at the installation
- CHELCO and Sain Engineering Associates conducted a preliminary audit
- Found they could save \$100,000 per year on Site C-6's energy bill with payback estimated at 8.5 years
- Construction began in Nov. 1999
- Over \$1.3 million in capital improvements



## ***ECM's Implemented at Eglin AFB***

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- Unoccupied temperature set-back
- Lighting controls and upgrades
- Chiller optimization
- Conversion of multi-zone air handling units to multi-zone variable air volume
- Primary/secondary pumping – installed variable frequency drives on two secondary chiller water pumps & pump controls
- High efficiency motors



***Contact at CHELCO for more info***

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## ***Financing & Payments***

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- Loans financed through CFC
- Interest rate - 1.05 times the monthly rate for variable rate long-term economic & business development loans issued by CFC
- Monthly interest payment equal to  $1/120$  of total ECO activity cost for all in progress and completed task orders (10yr Payback)
- Nolin Receives 7% management fee on all projects

## **National Rural Utilities Cooperative Finance Corporation (CFC)**

- Is a private not-for-profit financing organization since 1969
- Is a cooperative....owned by its 1000 member RECs
- Has over \$20 billion in assets
- Is double A rated





## ***Contract***

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- o Simple Language
- o Length – 9 pages
- o Environmental Exclusion
- o Financial Description
- o Insurances and Warranties
- o Payment Schedule



## ***Contract Status***

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- o 41 ECO's
- o Schools and Commissary ECO's
- o 6.5 million dollars



## *Savings to Government*

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- 13,732,790 KWH Annual
- \$1,350,868 Annual Savings
- \$222,274 Annual Positive Cash Flow

# Army Energy Conservation Award

*Celebrating 60 years of service*

## Partners in savings

**Nolin RECC and Fort Knox win national award with unique energy management program**  
by Shanda Crosby

Fort Knox and the nation's gold reserve go together. It's nearly impossible to think of one without thinking of the other. But while Fort Knox and gold may be a combination known around the nation, it isn't the only partnership bringing national recognition to the Army installation in Hardin County.

Teaming up with Nolin RECC to cut energy costs, Fort Knox recently was awarded the prestigious Department of the Army Energy Conservation Award for 1997. In a unique and innovative partnership with the cooperative, Fort Knox implemented energy-efficient lighting, heating systems, and other energy-management techniques that saved nearly half a million dollars in energy costs last year. The ongoing program is the most successful of its kind and scope in the U.S. Army.

"It's a win-win program for both Nolin and Fort Knox," says Gary Meredith, P.E., energy/project manager for the post's Directorate of Base Operations Support Services Division. "The program costs the utility nothing and it costs Fort Knox nothing because we're paying for it with money we

were wasting. It makes sense. It's good for the government. It's good for the taxpayer. And it has enhanced the living and working conditions for soldiers and civilians here on the base."

Officially called demand-side management (DSM), the program is an outgrowth of the Energy Policy Act of 1992, which said government-funded facilities must reduce energy

consumption by 30 percent before the year 2005. "With this program, we are definitely moving in the right direction," said Meredith. The post estimates that the 32 projects either completed or under way will eventually save more than \$600,000 annually in energy costs.

Utility DSM programs are those which save energy on the user's side of the meter. The goal is to better control existing electrical capacity. While some utilities do not

promote DSM programs because of the resulting decrease in revenue, Nolin RECC is actively involved in promoting savings for its members. "We are committed to helping our



Col. Philip Jones, Director of Base Operations Support, and Vince Heuser, Operations and Engineering Manager at Nolin RECC, proudly display the Secretary of the Army Energy Conservation Award.

members in whatever way we can," said Vince Heuser, Nolin's operations and engineering manager. "As a member-owned cooperative, our primary focus is not increasing revenue, but helping our members save money."

After unsuccessfully attempting for two years to establish a DSM effort with an investor-owned utility, Fort Knox engineers contacted Nolin, which is one of four electricity suppliers that serve the post. Heuser, working with Steve Fries, a contracting officer, Tim Goblirsch, an attorney assigned to the post's staff judge advocate, and Meredith, drew up a contract that provided mutual benefits.

For installing the energy management equipment, Nolin receives a one-time management fee. Meanwhile, Fort Knox is using a portion of the savings to pay the debt service on the cost of installation over a 10-year period.

"After 10 years, when the debt service is paid off, we get all the savings, along with the benefits of the improvements," Meredith said. "The people we talk to in the Department of Defense say they do not know of another program in the country even close to this."

The \$2.7 million in work so far under the program includes 12,000 new or retrofitted lighting fixtures and ballasts, more than 27,000 installed tubes, new window overlays, steam pipe insulation, occupancy sensors, and other improvements that are anticipated to result in a savings of more than 8 1/2 million kilowatt hours per year.

The most sizable expenditure will be the installation of a system that will electronically monitor and control nearly every element of the Fort Knox power system. The Army base owns its own power lines and substations. The system, known as SCADA (Supervisory Control and Data Acquisition), provides second-by-second information on such conditions as load flow, voltage and current, and the status of capacitor banks, circuit breakers, and voltage regulators. SCADA technology also allows load management and remote meter reading. When fully operational next year, the system will provide faster service restoration, greater reliability, and better quality service.

"This DSM program is unique in that any number or type of energy savings projects can be funded," Meredith said. "It's been a wonderful thing for us. As long as they're

*Celebrating 60 years of service*



Gary Meredith, Energy Project Manager for Fort Knox, explains how the project continues to save taxpayers money.

energy-smart, we can do as many projects as we want. It's a wide-open program."

The achievement has garnered Fort Knox praise from Army commanders all over the nation. In a letter to Major General George H. Hartweg, commander of the Fort Knox post, high-ranking Army General William W. Hartog wrote, "This achievement recognizes the consistent hard work and dedication by the members of your staff, which ultimately earned Fort Knox this prestigious award. I share your pride as the Fort Knox community is recognized for its outstanding efforts."

It couldn't have happened, Meredith says, without a willing, capable, and trustworthy utility partner. "We attempted for a couple of years to get a local utility to help us and that didn't work out," he said. "We only had to ask Nolin once and they responded with great vision and expertise. This couldn't work without trust and goodwill between Fort Knox and Nolin RECC. Vince has done a tremendous job of working with us, and the program has been really well accepted around the post. There is no way either party can lose. In fact, Fort Knox becomes more of a winner with each passing year."

*Photos courtesy of East Kentucky Power*